

Claims.

1 1. A method for deploying a computer application on a
2 network, comprising the steps of:

3 installing an application on a local file system of
4 an application server to define a locally installed ap-
5 plication; and

6 relocating said locally installed application onto a
7 shared file system by the steps of:

8 identifying shareable files among files of said
9 application, said shareable files being shareable
10 among multiple instances of said application;

11 moving said shareable files from said locally in-
12 stalled application to said shared file system to de-
13 fine relocated files; and

14 establishing symbolic links on said application
15 server that are directed to corresponding locations
16 of said relocated files.

1 2. The method according to claim 1, wherein said step
2 of relocating said locally installed application further
3 comprises the steps of:

4 identifying instance read/write files among said
5 files of said application; and

6 establishing said instance read/write files in at
7 least one subtree of said local file system.

1 3. The method according to claim 1, further comprising
2 the steps of:

3 initializing a cache in said application server; and
4 executing a configuration script following performance
5 of said steps of installing an application and relocating
6 said locally installed application.

1 4. The method according to claim 1, wherein said step
2 of relocating said locally installed application further
3 comprises associating at least one application file element
4 with a 4-tuple, wherein:

5 a first value SharedDir of said 4-tuple specifies a root
6 directory in said shared file system;

7 a second value LocalDir of said 4-tuple specifies a first
8 subdirectory in said local file system;

9 a third value policy of said 4-tuple specifies a file
10 creation policy that applies to said local file system;
11 and

12 a fourth value script is a reference to a configuration
13 script.

1 5. The method according to claim 4, wherein said third
2 value policy specifies a step of creating said first
3 subdirectory in said local file system.

1 6. The method according to claim 4, wherein said file
2 creation policy specifies a step of creating a first symbolic
3 link in said local file system to a remote file.

1 7. The method according to claim 4, wherein said file
2 creation policy specifies creating in said local file
3 system a first symbolic link to a remote subdirectory and
4 a second symbolic link to a remote file.

1 8. The method according to claim 4, further compris-
2 ing the step of modifying at least one of said files of
3 said application by executing said configuration script.

1 9. The method according to claim 4, wherein said step
2 of relocating said locally installed application is per-
3 formed by:

4 in a first event that said file creation policy
5 specifies the step of creating one of said symbolic
6 links.

1 10. The method according to claim 4, wherein said
2 step of relocating said locally installed application
3 further comprises the step of:

4 in a second event that said file creation policy
5 specifies an exclusive creation of subdirectories, creat-
6 ing said first subdirectory in said local file system.

1 11. The method according to claim 10, wherein said
2 step of creating said first subdirectory comprises adding
3 said first subdirectory to a set of subdirectories to be
4 created.

1 12. The method according to claim 4, wherein said ap-
2 plication file element comprises said root directory.

1 13. The method according to claim 12, wherein said
2 step of relocating said locally installed application is
3 performed by successively associating application file
4 elements of said root directory with said 4-tuple.

1 14. The method according to claim 13, wherein said
2 step of relocating said locally installed application is
3 performed by recursively mapping a subtree of said local
4 file system onto said shared file system.

1 15. The method according to claim 13, wherein at
2 least a portion of said application file elements of said
3 root directory are substituted for said first value
4 SharedDir and said second value LocalDir of said 4-tuple.

1 16. The method according to claim 4, further compris-
2 ing the step of executing said configuration script.

1 17. The method according to claim 4, wherein said
2 step of relocating said locally installed application is
3 performed by:
4 in a first event that said file creation policy
5 specifies creation of said symbolic links, creating one
6 of said symbolic links; and

7 in a second event that said file creation policy
8 specifies exclusive creation of subdirectories, creating
9 said first subdirectory in said local file system.

1 18. The method according to claim 17, wherein said
2 step of creating said subdirectory comprises adding said
3 first subdirectory to a set of subdirectories to be cre-
4 ated.

1 19. The method according to claim 17, wherein said
2 application file element comprises said root directory.

1 20. The method according to claim 19, wherein said
2 step of relocating said locally installed application is
3 performed by successively associating application file
4 elements of said root directory with said 4-tuple.

1 21. The method according to claim 20, wherein said
2 step of relocating said locally installed application is
3 performed by recursively mapping a subtree of said local
4 file system onto said shared file system.

1 22. The method according to claim 20, wherein at
2 least a portion of said application file elements of said
3 root directory are substituted for said first value
4 SharedDir and said second value LocalDir of said 4-tuple.

1 23. A method for deploying a computer application on
2 a network, comprising the steps of:

3 selecting an application server of a cluster for ap-
4 plication priming thereof;

5 installing an application on a local file system of
6 said application server according to an installation pro-
7 cedure of an installation management node of said cluster
8 to define a locally installed application;

9 relocating said locally installed application onto a
10 shared file system, wherein said shared file system mir-
11 rors an application directory of said installation man-
12 agement node, by the steps of:

13 identifying files of said application as func-
14 tionally read-only files, instance read/write files,
15 and application read/write files;

16 moving said functionally read-only files from
17 said locally installed application to said shared
18 file system to define relocated functionally
19 read-only files;

20 moving said application read/write files from
21 said locally installed application to said shared
22 file system to define relocated application
23 read/write files;

24 automatically establishing said instance
25 read/write files in at least one subtree of said lo-
26 cal file system; and

27 automatically establishing symbolic links on said
28 application server that are directed to corresponding

29 locations of said relocated functionally read-only
30 files and said relocated application read/write
31 files.

1 24. The method according to claim 23, wherein said
2 relocated functionally read-only files comprise a con-
3 figuration file.

1 25. The method according to claim 23, wherein said
2 step of identifying said files of said application is
3 performed off-line.

1 26. The method according to claim 23, wherein said
2 steps of selecting an application server, installing said
3 application, and relocating said application are per-
4 formed using a data management process and a daemon,
5 wherein said daemon executes on said application server.

1 27. The method according to claim 26, wherein said
2 application server comprises a plurality of application
3 servers that receive a multicast, said multicast being
4 initiated by said data management process while at least
5 one of said steps of selecting an application server, in-
6 stalling said application, and relocating said applica-
7 tion is being performed.

1 28. The method according to claim 23, wherein said
2 step of relocating said locally installed application
3 further comprises mapping a 4-tuple, wherein:

4 a first value SharedDir of said 4-tuple specifies a
5 root directory in said shared file system;

6 a second value LocalDir of said 4-tuple specifies a
7 first subdirectory in said local file system;

8 a third value policy of said 4-tuple specifies a file
9 creation policy that applies to said local file system;
10 and

11 a fourth value script is a reference to a configura-
12 tion script.

1 29. The method according to claim 28, wherein said
2 file creation policy specifies a step of creating said
3 first subdirectory in said local file system.

1 30. The method according to claim 28, wherein said
2 file creation policy specifies a step of creating a first
3 symbolic link in said local file system to a remote file.

1 31. The method according to claim 28, wherein said
2 file creation policy specifies creating in said local
3 file system a first symbolic link to a remote subdirec-
4 tory and a second symbolic link to a remote file.

1 32. The method according to claim 28, wherein said
2 configuration script modifies said files of said applica-
3 tion, wherein said files of said application are located
4 on said local file system.

1 33. A computer software product, comprising a com-
2 puter-readable medium in which computer program instruc-
3 tions are stored, wherein said instructions, when read by
4 a computer, cause the computer to deploy an application
5 on a network by executing the steps of:

6 installing an application on a local file system of
7 an application server to define a locally installed ap-
8 plication; and

9 relocating said locally installed application onto a
10 shared file system by the steps of:

11 identifying shareable files among files of said
12 application, said shareable files being shareable
13 among multiple instances of said application;

14 moving said shareable files from said locally in-
15 stalled application to said shared file system to de-
16 fine relocated files; and

17 establishing symbolic links on said application
18 server that are directed to corresponding locations
19 of said relocated files.

1 34. The computer software product according to
2 claim 33, wherein said step of relocating said locally
3 installed application further comprises the steps of:

4 identifying instance read/write files among said
5 files of said application; and
6 establishing said instance read/write files in at
7 least one subtree of said local file system.

1 35. The computer software product according to
2 claim 33, further comprising the step of executing a con-
3 figuration script following performance of said steps of
4 installing an application and relocating said locally in-
5 stalled application.

1 36. The computer software product according to
2 claim 33, wherein said step of relocating said locally
3 installed application further comprises associating at
4 least one application file element with a 4-tuple,
5 wherein:

6 a first value SharedDir of said 4-tuple specifies a
7 root directory in said shared file system;

8 a second value LocalDir of said 4-tuple specifies a
9 first subdirectory in said local file system;

10 a third value policy of said 4-tuple specifies a file
11 creation policy that applies to said local file system;
12 and

13 a fourth value script is an optional reference to a
14 configuration script.

1 37. The computer software product according to
2 claim 36, wherein said file creation policy specifies a
3 step of creating said first subdirectory in said local
4 file system.

1 38. The computer software product according to
2 claim 36, wherein said file creation policy specifies a
3 step of creating a first symbolic link in said local file
4 system to a remote file.

1 39. The computer software product according to
2 claim 36, wherein said file creation policy specifies
3 creating in said local file system a first symbolic link
4 to a remote subdirectory and a second symbolic link to a
5 remote file.

1 40. The computer software product according to
2 claim 36, further comprising the step of modifying at
3 least one of said files of said application by executing
4 said configuration script.

1 41. The computer software product according to
2 claim 36, further comprising the step of modifying at
3 least one system file by executing said configuration
4 script.

1 42. The computer software product according to
2 claim 36, wherein said step of relocating said locally
3 installed application is performed by:

4 in a first event that said file creation policy
5 specifies creation of said symbolic links, creating one
6 of said symbolic links.

1 43. The computer software product according to
2 claim 36, wherein said step of relocating said locally
3 installed application is performed by:

4 in a second event that said file creation policy
5 specifies exclusive creation of subdirectories, creating
6 said first subdirectory in said local file system.

1 44. The computer software product according to
2 claim 43, wherein said step of creating said first subdi-
3 rectory comprises adding said first subdirectory to a set
4 of subdirectories to be created.

1 45. The computer software product according to
2 claim 36, wherein said application file element comprises
3 said root directory.

1 46. The computer software product according to
2 claim 45, wherein said step of relocating said locally
3 installed application is performed by successively asso-
4 ciating application file elements of said root directory
5 with said 4-tuple.

1 47. The computer software product according to
2 claim 46, wherein said step of relocating said locally
3 installed application is performed by recursively mapping
4 a subtree of said local file system onto said shared file
5 system.

1 48. The computer software product according to
2 claim 46, wherein during said step of relocating said lo-
3 cally installed application at least a portion of said
4 application file elements of said root directory are sub-
5 stituted for said first value SharedDir and said second
6 value LocalDir of said 4-tuple.

1 49. The computer software product according to
2 claim 36, further comprising the step of executing said
3 configuration script.

1 50. The computer software product according to
2 claim 36, wherein said step of relocating said locally
3 installed application is performed by:

4 in a first event that said file creation policy
5 specifies creation of said symbolic links, creating one
6 of said symbolic links; and

7 in a second event that said file creation policy
8 specifies exclusive creation of subdirectories, creating
9 said first subdirectory in said local file system.

1 51. The computer software product according to
2 claim 50, wherein said step of creating said first subdi-
3 rectory comprises adding said first subdirectory to a set
4 of subdirectories to be created.

1 52. The computer software product according to
2 claim 50, wherein said application file element comprises
3 said root directory.

1 53. The computer software product according to
2 claim 52, wherein said step of relocating said locally
3 installed application is performed by successively asso-
4 ciating application file elements of said root directory
5 with said 4-tuple.

1 54. The computer software product according to
2 claim 53, wherein said step of relocating said locally
3 installed application is performed by recursively mapping
4 a subtree of said local file system onto said shared file
5 system.

1 55. The computer software product according to
2 claim 53, wherein at least a portion of said application
3 file elements of said root directory are substituted for
4 said first value SharedDir and said second value LocalDir
5 of said 4-tuple.

1 56. A computer software product, comprising a com-
2 puter-readable medium in which computer program instruc-
3 tions are stored, wherein said instructions, when read by
4 a computer, cause the computer to deploy an application
5 on a network by executing the steps of:

6 selecting an application server of a cluster for ap-
7 plication priming thereof;

8 installing an application on a local file system of
9 said application server according to an installation pro-
10 cedure of an installation management node of said cluster
11 to define a locally installed application;

12 relocating said locally installed application onto a
13 shared file system, wherein said shared file system mir-
14 rors an application directory of said installation man-
15 agement node, and said step of relocating said locally
16 installed application is performed by:

17 identifying files of said application as func-
18 tionally read-only files, instance read/write files,
19 and application read/write files;

20 moving said functionally read-only files from
21 said locally installed application to said shared
22 file system to define relocated functionally
23 read-only files;

24 moving said application read/write files from
25 said locally installed application to said shared
26 file system to define relocated application
27 read/write files;

28 automatically establishing said instance
29 read/write files in at least one subtree of said lo-
30 cal file system; and

31 automatically establishing symbolic links on said
32 application server that are directed to corresponding
33 locations of said relocated functionally read-only
34 files and said relocated application read/write
35 files.

1 57. The computer software product according to
2 claim 56, wherein said relocated functionally read-only
3 files comprise a configuration file.

1 58. The computer software product according to
2 claim 56, wherein said step of identifying files of said
3 application is performed off-line.

1 59. The computer software product according to
2 claim 56, wherein said steps of selecting an application
3 server, installing an application, and relocating said
4 locally installed application are performed using a data
5 management process and a daemon, wherein said daemon exe-
6 cutes on said application server.

1 60. The computer software product according to
2 claim 59, wherein said application server comprises a
3 plurality of application servers that receive a multi-
4 cast, said multicast being initiated by said data manage-
5 ment process while at least one of said steps of select-
6 ing an application server, installing an application, and
7 relocating said locally installed application is being
8 performed.

1 61. The computer software product according to
2 claim 56, wherein said step of relocating said locally
3 installed application further comprises mapping a
4 4-tuple, wherein:

5 a first value SharedDir of said 4-tuple specifies a
6 root directory in said shared file system;

7 a second value LocalDir of said 4-tuple specifies a
8 first subdirectory in said local file system;

9 a third value policy of said 4-tuple specifies a file
10 creation policy that applies to said local file system;
11 and

12 a fourth value script is a reference to a configura-
13 tion script.

1 62. The computer software product according to
2 claim 61, wherein said file creation policy specifies a
3 step of creating said first subdirectory in said local
4 file system.

1 63. The computer software product according to
2 claim 61, wherein said file creation policy specifies a
3 step of creating a first symbolic link in said local file
4 system to a remote file.

1 64. The computer software product according to
2 claim 61, wherein said file creation policy specifies
3 creating in said local file system a first symbolic link
4 to a remote subdirectory and a second symbolic link to a
5 remote file.

1 65. The computer software product according to
2 claim 61, wherein said configuration script modifies said
3 files of said application, wherein said files of said ap-
4 plication are located on said local file system.

1 66. A computer system comprising:
2 a computer having computer program instructions
3 stored therein, wherein said instructions, when read by
4 said computer, cause said computer to deploy an applica-
5 tion on a network by executing the steps of:
6 installing an application on a local file system of
7 an application server to define a locally installed ap-
8 plication; and
9 relocating said locally installed application onto a
10 shared file system by the steps of:

11 identifying shareable files among files of said
12 application, said shareable files being shareable
13 among multiple instances of said application;

14 moving said shareable files from said locally in-
15 stalled application to said shared file system to de-
16 fine relocated files; and

17 establishing symbolic links on said application
18 server that are directed to corresponding locations
19 of said relocated files.

1 67. The computer system according to claim 66,
2 wherein said step of relocating said locally installed
3 application further comprises the steps of:

4 identifying instance read/write files among said
5 files of said application; and

6 establishing said instance read/write files in at
7 least one subtree of said local file system.

1 68. The computer system according to claim 66, fur-
2 ther comprising the steps of:

3 initializing a cache in said application server; and
4 executing a configuration script following perform-
5 ance of said steps of installing an application and relo-
6 cating said locally installed application.

1 69. The computer system according to claim 66,
2 wherein said step of relocating said locally installed
3 application further comprises associating at least one
4 application file element with a 4-tuple, wherein:

5 a first value SharedDir of said 4-tuple specifies a
6 root directory in said shared file system;

7 a second value LocalDir of said 4-tuple specifies a
8 first subdirectory in said local file system;

9 a third value policy of said 4-tuple specifies a file
10 creation policy that applies to said local file system;
11 and

12 a fourth value script is a reference to a configura-
13 tion script.

1 70. The computer system according to claim 69,
2 wherein said file creation policy specifies a step of
3 creating said first subdirectory in said local file sys-
4 tem.

1 71. The computer system according to claim 69,
2 wherein said file creation policy specifies a step of
3 creating a first symbolic link in said local file system
4 to a remote file.

1 72. The computer system according to claim 69,
2 wherein said file creation policy specifies creating in
3 said local file system a first symbolic link to a remote
4 subdirectory and a second symbolic link to a remote file.

1 73. The computer system according to claim 69,
2 wherein said configuration script modifies at least one
3 of said files of said application, wherein said files of
4 said application are located on said local file system.

1 74. The computer system according to claim 69,
2 wherein said configuration script modifies at least one
3 of said files of said application.

1 75. The computer system according to claim 69,
2 wherein said configuration script modifies at least one
3 system file.

1 76. The computer system according to claim 69,
2 wherein said step of relocating said locally installed
3 application is performed by:

4 in a first event that said file creation policy
5 specifies creation of said symbolic links, creating one
6 of said symbolic links.

1 77. The computer system according to claim 69,
2 wherein said step of relocating said locally installed
3 application is performed by:

4 in a second event that said file creation policy
5 specifies exclusive creation of subdirectories, creating
6 said first subdirectory in said local file system.

1 78. The computer system according to claim 77,
2 wherein said step of creating said first subdirectory
3 comprises adding said first subdirectory to a set of sub-
4 directories to be created.

1 79. The computer system according to claim 69,
2 wherein said application file element comprises said root
3 directory.

1 80. The computer system according to claim 79,
2 wherein said step of relocating said locally installed
3 application is performed by successively associating ap-
4 plication file elements of said root directory with said
5 4-tuple.

1 81. The computer system according to claim 80,
2 wherein said step of relocating said locally installed
3 application is performed by recursively mapping a subtree
4 of said local file system onto said shared file system.

1 82. The computer system according to claim 80,
2 wherein during said step of relocating said locally in-
3 stalled application at least a portion of said applica-
4 tion file elements of said root directory are substituted
5 for said first value SharedDir and said second value Lo-
6 calDir of said 4-tuple.

1 83. The computer system according to claim 69, fur-
2 ther comprising the step of executing said configuration
3 script.

1 84. The computer system according to claim 69,
2 wherein said step of relocating said locally installed
3 application is performed by:

4 in a first event that said file creation policy
5 specifies creation of said symbolic links, creating one
6 of said symbolic links; and

7 in a second event that said file creation policy
8 specifies exclusive creation of subdirectories, creating
9 said first subdirectory in said local file system.

1 85. The computer system according to claim 84,
2 wherein said step of creating said first subdirectory
3 comprises adding said first subdirectory to a set of sub-
4 directories to be created.

1 86. The computer system according to claim 84,
2 wherein said application file element comprises said root
3 directory.

1 87. The computer system according to claim 86,
2 wherein said step of relocating said locally installed
3 application is performed by successively associating ap-
4 plication file elements of said root directory with said
5 4-tuple.

1 88. The computer system according to claim 87,
2 wherein said step of relocating said locally installed
3 application is performed by recursively mapping a subtree
4 of said local file system onto said shared file system.

1 89. The computer system according to claim 87,
2 wherein at least a portion of said application file ele-
3 ments of said root directory are substituted for said
4 first value SharedDir and said second value LocalDir of
5 said 4-tuple.